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THE WILD TURKEY AND ITS DOMESTICATION.

BY HON. J. D. CATON.

I HAVE been well acquainted with the wild turkey (*Meleagris gallopavo*) of this country for over forty years, and have had good opportunities of studying it in its wild state, and for more than ten years past I have raised it in domestication, having had sometimes over ninety in my grounds at one time, and having raised more than sixty in a single year. Some observations on their habits and domestication may not be uninteresting.

My original stock was procured from eggs taken from the nest of the wild hen, in the woods, and raised under the common hen, and it has been twice replenished in the same way, on one occasion with seven individuals. The purity of the stock, therefore, cannot be questioned; but still more conclusive evidence was in the markings, so fully and accurately described by Audubon, Baird, and others. I know of no bird or animal where the markings are more constant or reliable than on the wild turkey; even to the number of bars on a given quill of the wing, for instance, which may be relied upon to identify it.

The young bird from the egg of the wild turkey, when brought up in close intimacy with the human family, becomes very tame, and when grown the males become vicious and attack children and even grown persons. I once had eight hatched out by a hen, and gave them in charge to the wife of a tenant, with stimulating promises if she raised them, and she did it nicely. They were allowed to go into the house, to fly upon the table, and to eat with the children. Until they were grown, any member of the family could go up to one and pick it up at any time, but they were afraid of strangers, and if anything excited their suspicion they would take wing and be off like a flock of quails.

At first I procured but a single pair of wild turkeys. The sea-

son they were a year old neither showed the least inclination to breed. The male was not heard to gobble, the wattles upon the neck did not turn red, and he was not observed to *strut*, as is usual with the male turkey in the breeding season. The next year he made up for all this, and the female also well repaid me for waiting. All the others I have had have bred freely when a year old.

I am now wintering the eleventh generation of the domesticated wild turkey, though the progenitors of a portion of my flock were introduced more recently. They generally occupy the South Park, about forty acres in extent, mostly covered with second-growth trees of about twenty-five years' standing, with a considerable number of old oak trees interspersed. In the park are ravines with good hiding-places. It is heavily set with bluegrass and some white clover.

The effect of domestication has been very marked. They have not deteriorated in size or in reproductive powers. They have always been healthy excepting in the summer of 1869, when they were afflicted with some disease from which about three quarters of the flock died. They have changed in form and in the length of the legs. The body is shorter and more robust, and its position is more horizontal; but most especially have they varied in color. These changes I have constantly watched. In the first and even the second generation but little change was observed. After that the tips of the tail feathers and of the tail coverts began to lose the soft, rich chestnut brown so conspicuous on the wild turkey of the woods, and to degenerate to a lighter shade; the beautiful, changeable purple tints on the neck and breast became marked with a greenish shade; the bristles on the naked portions about the head became more sparse or altogether disappeared; the blue about the head and the purple of the wattles were replaced by the bright red observed on the tame turkey-cock; the beautiful pinkish-red of the legs became dull or changed to brown. The next year, or when the bird was in its second year's growth, say in the third generation, these marks of degeneration would on most of the specimens, especially of the cocks, disappear, and the plumage would show the thorough-bred wild turkey. Each succeeding generation shows these changes to be more pronounced, but each year as the bird gets older the shades of color of the wild parent become more distinct. The change of form keeps pace with the change of color, which is much more manifest on the hen than on the cock. I have hens now three or

four years old with brown legs, though still showing the pink shade, and on whose feathers the white has very considerably replaced the cinnamon shades. In fact I have many specimens that would readily pass for the bronze domestic turkey, even in the view of an expert. I am satisfied that without a fresh infusion of wild blood, in the course of fifteen or twenty years more but few individuals would show the distinctive marks of the wild turkey to any considerable extent, and the whole would be pronounced the bronze domestic turkey. This change is much more manifest in some individuals than in others, still it is very marked in all. I have met with several farmers in the West who have domesticated the wild turkey and whose experiences correspond with my own, but they are not writing men, though frequently pretty good observers. The truth is that those having the most facts on this particular subject do not appreciate their importance, and the observations they have made are never known to the scientists who are most capable of weighing and comparing them, and it is possible that these have fallen into errors for the want of full data.

The habits of the wild turkey are not as rapidly changed by domestication as its form and coloring; still they undergo a change as well. The wild cock-turkey by the time he is five months old seeks a perch well up in the largest trees in his range, and as he grows older he is constantly inclined to seek a higher perch, till he is frequently found at the very apex of the tallest tree. The largest turkey I ever killed sat at the extreme top of a very tall tree, which enabled me to see him against the background of the clear eastern sky as the day was breaking, while all below was profound darkness, and so I had plenty of time to approach behind another large tree with the most deliberate caution to within range, and there I had to wait a considerable time before I could see the sights of the rifle. He was already alarmed and stood as straight as a penguin, which is the constant habit of the bird when his suspicions are awakened. Fearing he would leave I fired before I could tell whether his back or his breast was towards me. When a twenty-four pound turkey falls from so great a height, and thrashing through the branches of the tree strikes the ground with a great crash, it is music to the ear of him who can claim the prize. A companion once killed a very large cock on the top of a very large tree, under which we had made our camp fire, where he had sat for hours undisturbed by the noise and bustle of our camp. As we had approached

the place without caution, — laughing, talking, and perhaps singing, — he knew he was undiscovered and not likely to be looked for there, and so felt no apprehension, and it was only by an accident that his presence was found out. These incidents tell us of the habits of the bird.

This disposition, especially of the cock, to seek a high perch is scarcely impaired by domestication in the second and third generations, but after that they seem less ambitious for high places, and it appears to grow less and less in succeeding generations, till they come down to about the level of the domestic turkey.

The wild and suspicious timidity so characteristic of the wild turkey is eradicated very slowly. When back in the park foraging they seem suspicious even of the one who daily feeds them, and make off when they see him approaching; but upon their feeding grounds most of them come to pick up the corn even within a few feet of strangers. Let any cause of alarm, however, occur there and they take fright at once. Those only two or three generations from the woods will take wing, while the others will run like race-horses. This wildness, however, diminishes with each succeeding generation.

The eggs of the wild turkey vary much in coloring and somewhat in form, but in general are so like those of the tame turkey, that no one can select one from the other. The ground color is white, over which are scattered reddish-brown specks. These differ in shades of color but much more in numbers. I have seen some on which scarcely any specks could be detected, while others were profusely covered with specks, all laid by the same hen in the same nest. The turkey eggs are more pointed than those of the goose or the barn-yard fowl, and are much smaller in proportion to the size of the bird.

When the wild turkey in the forest voluntarily leaves her nest, she always covers it with leaves sufficient to hide the eggs and all evidence of the nest. This is less carefully done by the first descendants of the wild hen, and each succeeding generation becomes more careless in this regard, till now more than half the nests we find are not covered at all, and none are covered with the care always manifest in the wild state.

This wildness seems the most constant with the hen in the breeding season. When the hens are about to commence laying, they seem to relapse to their native wildness and seek the seclusion of the North and East parks, or if their wings are not clipped they may escape from the park to the neighboring forest and

there rear their young. After these get as large as quails, or perhaps larger, they generally bring them home, or with a little care they may be driven home. Although the young birds are as wild as possible at first, after they have tasted corn a few times and find it is furnished by a man on foot or from a buggy, they lose all fear and become importunate, while the mother hen may still hang back suspiciously. I have often, when driving through the park, had the half-grown birds fly into the covered rock-away for corn, for they soon learned there was always corn there for them.

The cocks after a few generations never get as wild as the hens do at the breeding season, but stay contentedly in the South Park, and nearly always keep together. They may amount to fifteen or twenty in number. If the nest of a hen is broken up she immediately seeks the cocks and then returns to seclusion, and generally she will even make a third nest if the second is destroyed. I have never seen the cocks fight for the hens, although there may be a dozen of them of equal age and size. These seem to have no leader and to have no master, and rarely have disputes except when being fed. Then one is very apt to make a pass at another, which is most likely returned, when two or three others will join in the fray, appearing quite indifferent as to which they hit. After a fracas of two or three minutes they all seem to remember that it is supper time, but on looking about they discover that the hens and the youngsters have taken it all. Whenever the new broods are brought home in the fall, they must be attacked by the home flock, — the old cocks, the barren hens, and the young ones, which have been initiated through similar tribulations. The mother hen is treated as a stranger just as much as if she had never been there before. A single day, however, is sufficient to establish friendly relations, when the newcomers are admitted to the family circle on cordial terms.

I have never noticed any disposition of the old cocks to interfere with a setting hen, or her nest, or her young brood, only when a half-grown flock comes home they are simply treated as strangers, as already stated.

The pinion of a wing has been removed from many of the old hens, and if the latter are kept in the South Park where the cocks run, and which is really the home of all, they nest there, frequently making the nest by a slight excavation in the open grass-plot, away from any protecting object, and one is astonished at the difficulty of finding the hen setting there, although the place

be described where to look. Experience has proved that I do not get nearly as many young from those which are obliged to nest in the South Park as from those which retire to complete seclusion and are never seen or heard of, except by chance, till their chicks are as large as quails.

My observations accord with those of Audubon as to the friendly relations existing between the brood hen-turkeys. It is not uncommon for two or three hens to lay in the same nest, and then set upon the eggs and raise the young together, though this I always look upon as a misfortune, for most likely they will not commence laying together, so that after one commences setting the other will keep on laying for a week or two before she commences setting. As neither will remain a day after the first chick is hatched, of course all the late-laid eggs are lost, unless they are taken out and put under a hen, when they generally hatch out, although they may have lain a day in the nest after they were deserted, if the weather is warm. The hen is often a very pertinacious setter, remaining upon the nest a week or more after all the eggs have been removed. I once found a hen setting upon an empty nest on a declivity of a ravine, and found the eggs scattered about, some very near the foot of the hill, and quite cold, — the mischief of a peacock. Those not broken were returned to the nest. When approached the hen ran away, but soon returned to the nest and hatched out every one of the eggs and raised the birds. The hen, so far as I have observed, never remains upon the nest longer than the morning after the first bird is hatched, though there may be no more than one bird out, leaving all the remaining eggs to their fate. When a day old the chick can follow the hen, though it may tumble down on every foot of the ground it runs over. When two or three days old it will follow the hen with astonishing vigor, and will trail through the grass in a cold rain storm without injury, when similar exposure would have been fatal to the domestic turkey. I have had repeated opportunities to test this, and I do not believe that I ever lost a young bird by reason of its getting wet. Even the hybrids<sup>1</sup> are capable of enduring exposure, when but a few days old, from which we should despair of the domestic bird.

When two young broods meet in the woods neither hen will show hostility to the young of the other, and they will generally separate after a little social intercourse; but sometimes they will

<sup>1</sup> I use this term not in its strict sense, but for convenience.

amalgamate and ever after range together, when each hen will take the same care of all as she did of her own. I have often seen three hens thus together leading around a large flock of young birds, the three broods being manifestly of unequal ages as they were of sizes.

The flesh of the young wild turkey is as white as that of the tame turkey till mid winter. After that it begins to show a darker shade, and when a year old the change of color is very appreciable, and this darker shade deepens till the bird is several years old. All of this is entirely lost by domestication. I have never killed a bird from an egg taken from the wild hen's nest in the woods, for I could not afford to do this, but I have had on my table many of the next generation, all the way from eight months to two or three years old, raised in my grounds. In every instance the flesh was as white as that of the domestic turkey. The change of food and the less active habits produce this change of color of the flesh of the wild turkey.

Turkeys consume more herbaceous food than is generally supposed. In the spring, when fresh vegetation shoots forth, they subsist almost entirely upon it, showing less anxiety for corn than at any other season. Blue-grass and clover they seem to prefer, and on these they graze almost as freely as the geese. Later, when insects appear, they manifest their carnivorous appetite and become constant and diligent foragers for them. They are not scavengers like the barn-yard fowl, but much prefer, if they do not confine themselves to, living animals. Still they by no means limit their selection to insects. I once saw a half-grown turkey acting very strangely, and stopped a little way off to notice his actions. I soon observed that he was in a contest with a snake about ten inches long. He would pick it up and throw it and again seize it as soon as it struck the ground. At length, after the snake seemed pretty well disabled he seized it by the head and began to swallow it. The part of the snake yet in sight thrashed vigorously around, sometimes winding itself around the head and neck of the bird. This was too much for the turkey, and he threw it up and went at it again to make it more quiet, and then another attempt was made to swallow it; but it was not till the third effort was made that success was achieved, and then the process occupied several minutes, the tail of the snake being all the time active till it finally disappeared.

This magnificent game bird was never a native of the Pacific coast. I have at various times sent in all about forty to Califor-



nia, in the hope that it may be acclimatized in the forests. Their numerous enemies have thus far prevented success in this direction, but they have done reasonably well in domestication, and Captain Rodgers, of the United States Coast Survey, has met with remarkable success in hybridizing them with the domestic bronze turkey. Last spring I sent some which were placed on Santa Clara Island, off Santa Barbara. They remained contentedly about the ranch building and, as I am informed, raised three broods of young which are doing well. As there is nothing on the island more dangerous to them than a very small species of fox, we may well hope that they will in a few years stock the whole island, which is many miles in extent. As the island is uninhabited except by the shepherds who tend the immense flocks of sheep there, they will soon revert to the wild state, when I have no doubt they will resume markings as constant as is observed in the wild bird here, but I shall be disappointed if the changed condition of life does not produce a change of color or in the shades of color, which would induce one unacquainted with their history to pronounce them specifically different from their wild ancestors here. Results will be watched with interest.

My experiments in crossing the wild with the tame have been eminently successful. These have been conducted at my farm in the country. I first sent up a cock and turned him out with a few domestic hens. They all raised good broods. The hybrids grew larger than either parent. The next year the hybrid hens, as the breeding time approached, manifested the wild disposition of their wild ancestor, but they had an artificial grove of ten acres a little distance from the buildings, which was set with a thick undergrowth, and here they nested. When they brought off the young broods, instead of keeping about the barns as their tame mothers did, they wandered off through the fields where they found an abundance of insects. There was no forest nearer than two miles, so I think none of them found their way to that. Some of them returned to the grove to roost at night, while others remained away. Pains were taken when they were met with in the fields to drive them to the barn and feed them with corn. This rarely had to be repeated, for they would come up themselves for their suppers. Some wandered away and never returned, but were afterwards recognized about the yards of neighbors perhaps miles away; in subsequent years they were much more easily kept in hand and probably few were lost, till now after seven years there is little trouble to keep them about the

place at night, although they wander off through the fields for a mile or more during the day, but they always get a ration of corn about sunset. Last fall the flock counted one hundred and ten, and was the finest I ever saw together. I have had turkeys on my table the past winter not eight months old that weighed seventeen pounds dressed, though some of the young hens did not exceed nine pounds. I have sent to the farm several thorough-bred cocks at different times, but as they were from my domesticated stock they did not seem to add much to the wildness of the birds.

My experiments establish, first, that the wild turkey may be domesticated and that each succeeding generation bred in domestication loses something of the wild disposition of its ancestors.

Second, that the wild turkey bred in domestication changes its form and the color of its plumage and of its legs, each succeeding generation degenerating more and more from those brilliant colors which are so constant on the wild turkey of the forest, so that it is simply a question of time — and indeed a very short time — when they will lose all of their native wildness and become clothed in all the varied colors of the common domestic turkey; in fact be like our domestic turkey, — yes, be our domestic turkey.

Third, that the wild turkey and the domestic turkey as freely interbreed as either does with its own variety, showing not the least sexual aversion always observed between animals of different species of the same genus, and that the hybrid progeny is as vigorous, as robust, and fertile as was either parent.

It must be already apparent that I, at least, have no doubt that our common domestic turkey is a direct descendant of the wild turkey of our forests, and that therefore there is no specific difference between them. If such marked changes in the wild turkey occur by only ten years of domestication, all directly tending to the form, habits, and colorings of the domestic turkey, — in all things which distinguish the domestic from the wild turkey, — what might we not expect from fifty or a hundred years of domestication? I know that the best ornithological authority at the present time declares them to be of a different species, but I submit that this is a question which should be reconsidered in the light of indisputable facts which were not admitted or established at the time such decision was made.

There has always been diffused among the domestic turkeys of the frontiers more or less of the blood of the wild turkey of the

neighboring forests, and as the wild turkey has been driven back by the settlement of the country, the domestic turkey has gradually lost the markings which told of the presence of the wild, though judicious breeding has preserved and rendered more or less constant some of this evidence in what is called the domestic bronze turkey; and the more these evidences are preserved in the bronze turkey, as the red leg and the tawny shade dashed upon the white terminals of the tail feathers and the tail coverts, the better should the stock be considered, because it is the more like its wild ancestor.

That the domestic turkey in its neighborhood may be descended from or largely interbred with the wild turkey of New Mexico, which in its wild state more resembles the common domestic turkey than our wild turkey does, may unquestionably be true, and it may be also true that the wild turkey there has a large infusion of the tame blood, for it is well known that not only our domestic turkey, but even our barn-yard fowls relapse to the wild state in a single generation when they are reared in the woods and entirely away from the influence of man, gradually assuming uniform and constant colorings. But I will not discuss the question whether the Mexican wild turkey is of a different species from ours or merely a variety of the same species, only with differences in color which have arisen from accidental causes, and certainly I will not question that the Mexican turkey is the parent of many domestic turkeys, but I cannot resist the conclusion that our wild turkey is the progenitor of our domestic turkey. Indeed, we know that this is so to a very large extent, from their constant interbreeding along our frontiers, and I never heard of any one who had wild blood in his flock who did not think he had as good domestic turkeys as any one else.

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## THE STUDY OF ZOÖLOGY IN GERMANY.

BY CHARLES SEDGWICK MINOT.

### I. THE LABORATORIES.

HAVING had somewhat extended opportunities for seeing various laboratories in Germany, and for working in some of them, the writer became much impressed by the great advantages they offer; and as they are at once training-schools and the scene of active original research, it seems appropriate to begin by some account of them.